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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/822,361

04/12/2004

Ilya Karpov

ITL.0835D1US (P14730D)

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10/24/2006

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EXAMINER

PHAM, LONG

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 10/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/822,361

Applicant(s)

KARPOV ET AL.

Examiner

Long Pham

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 10,11 and 16-23 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 10,11 and 16-23 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Rejections and/or objections necessitated by the amendments

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 10, line 7, "the thicker covering" has no antecedent basis.

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 10 and 16 and 19-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Nishida et al. (US patent 6,461,934).

With respect to claim 10, Nishida et al. teach an integrated circuit comprising (see figs. 1-5 and associated text):

a semiconductor structure 101 or substrate;

a first trench 103b formed of a first depth in said semiconductor structure;

a covering 106 on said first trench and over said semiconductor structure, said covering being thicker in said first trench than over said semiconductor structure; and

said covering having an opening through a portion of said covering that is over said semiconductor structure, said opening to define a region for a second trench.

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Further with respect to claim 10, Nishida et al. further teach the covering having an opening through a thinner portion of the covering that is over the semiconductor structure (fig. 3, covering 106 has thinner portion in the middle of the trench 103b and opening is formed in the middle of trench (see fig. 4) and the thinner portion other than the thicker portion of the covering in the first trench).

With respect to claim 16, Nishida et al. further teach the opening is a second trench. See figs. 1-5.

With respect to claim 19, Nishida et al. does not teach the opening 103b of fig. 4 does not extend through the thicker portion of the covering (the two sides of 106 in the trench) in the first trench to expose the semiconductor substrate.

With respect to claim 20, Nishida et al. does not teach the covering in the first trench has upstanding portion (the top portions of 106b) that extends (upperward) beyond a bottom surface of the trench trench 103c.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 11, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishida et al. (US patent 6,461,934) in combination with Wen et al (US patent 5,460,987).

With respect to claim 11 , Nishida et al. fail to teach that the covering is made of spin-on-glass material.

However, the use of spin-on-glass as covering material is well-known in the art.

With respect to claims 17 and 18, Nishida et al. fail to teach that opening for forming a second trench extends transversely or the opening for forming the

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second trench crosses the first trench and the second trench is shallower than the first trench.

Wen et al. teach forming a second trench crossing a first trench and the second trench is shallower than the first trench. See figs. 1-8 and associated text.

It would have been obvious to one of ordinary skill in the art of making semiconductor devices to incorporate the above teaching of Wen et al. into the device of Nishida et al. to reduce leakage current for the structure. See the abstract.

Claims 21, 22, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishida et al. (US patent 6,461,934) in combination with Wen et al (US patent 5,460,987).

With respect to claim 21, Nishida et al. teach an integrated circuit, comprising (see figs. 1-5 and associated text):

A semiconductor structure;

A first and second trench 103b, 103c formed in said semiconductor structure;

A covering 106 in said first trench and over the semiconductor structure, said covering having an opening therethrough, said opening in communication with said second trench.

Nishida et fail to teach the first trench formed to a first depth, said second trench transverse to the first trench and formed to a second depth less than said first depth.

Wen et al. teach forming a second trench crossing a first trench and the second trench is shallower than the first trench. See figs. 1-8 and associated text.

It would have been obvious to one of ordinary skill in the art of making

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semiconductor devices to incorporate the above teaching of Wen et al. into the device of Nishida et al. to reduce leakage current for the structure. See the abstract.

With respect to claim 22, Nishida et al. further teach covering 106 partially fills said first trench. See fig. 4.

With respect to claim 23, Nishida et al. further teach the covering in said first trench includes an upstanding portion (the portion of 106c in the middle of the trench of fig. 6) at the intersection of said first and second trenches, the upstanding portion extending above a bottom surface of said second trench to an upper surface of said substrate.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Long Pham whose telephone number is 571-272-1714. The examiner can normally be reached on Mon-Frid, 10am to 5pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Long Pham

Primary Examiner

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LP